

## Project Summary

The goals of this project were to design, fabricate, and evaluate a monopropellant test breadboard using industry standard S-405 catalyst with the nontoxic, energetic ionic liquid 2-hydroxyethylhydrazinium nitrate (HEHN). The test bed was successfully constructed and tested with HEHN. Five hot-fire test series totaling 32 tests were conducted, with three separate tests comprising a train of three pulses. Several of these tests were successfully demonstrated at bed preheat temperature of 200°C. Ignition drop tests demonstrated the ignition of HEHN at 200°C with S-405, which correlates well with these test bed results. The non-stoichiometric compounds with a 1:1.25, 1:1.5, and 1:1.75 ratio of HEH nitrates ignited at 150°C during drop tests, suggesting that the use of these more oxygen-balanced ionic liquids should be successful when used in the test bed at temperatures less than 200°C.